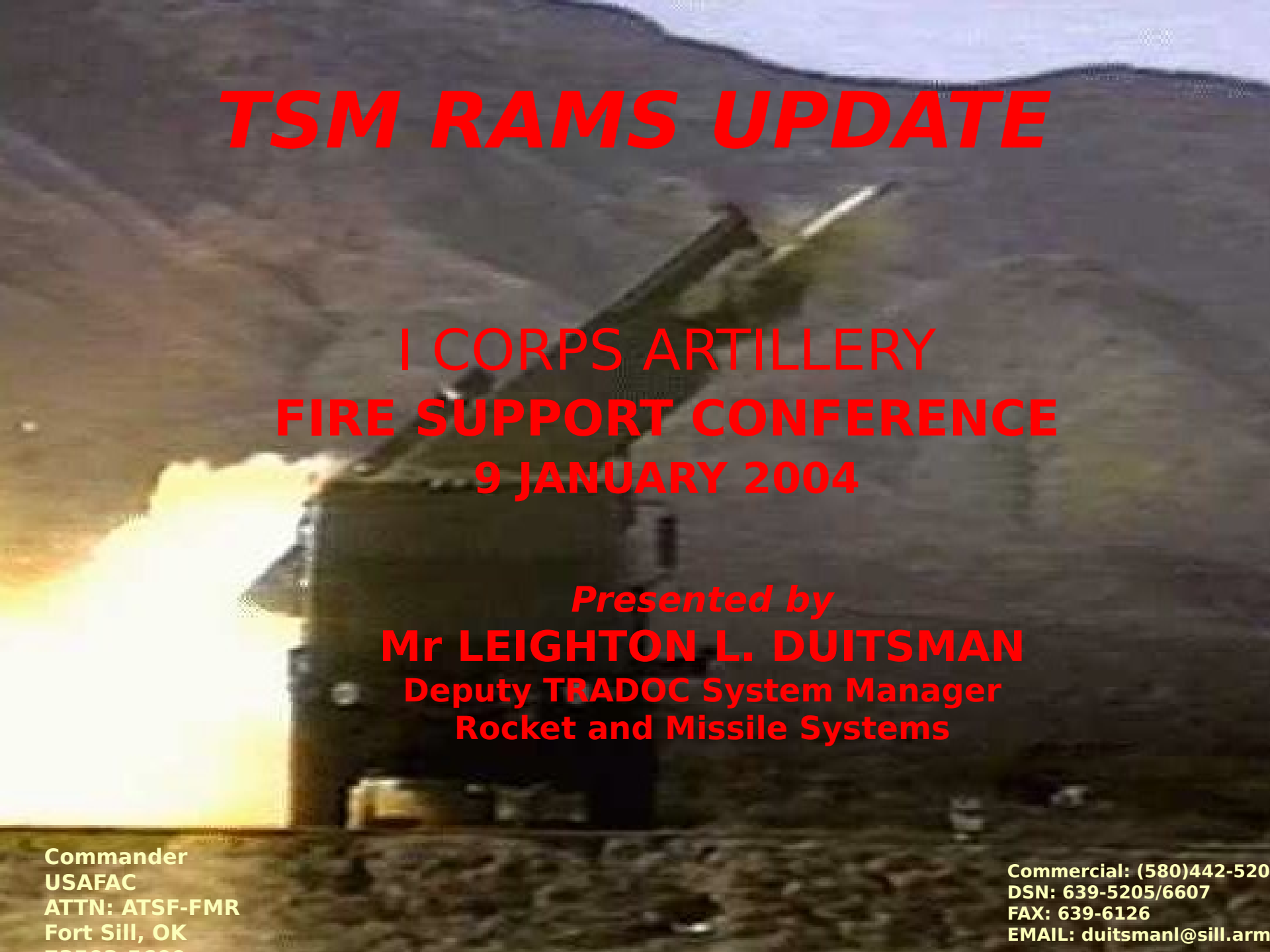

TSM RAMS UPDATE

I CORPS ARTILLERY
FIRE SUPPORT CONFERENCE
9 JANUARY 2004

Presented by

Mr LEIGHTON L. DUITSMAN

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Rocket and Missile Systems

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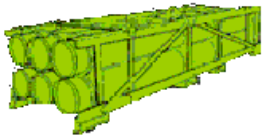
EMAIL: duitsmanl@sill.arm

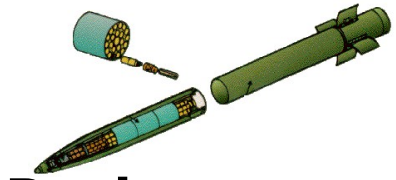
FA ROCKETS & MISSILES

M270 AI

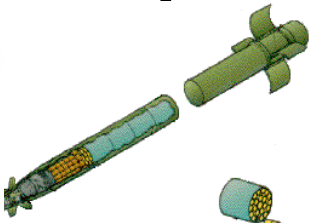


HIMARS

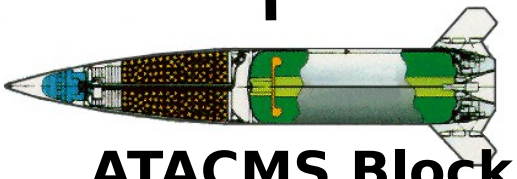
NLOS-LS



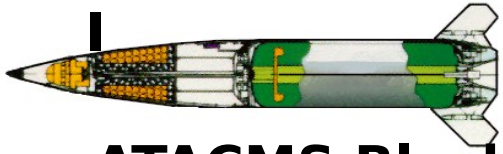
Basic



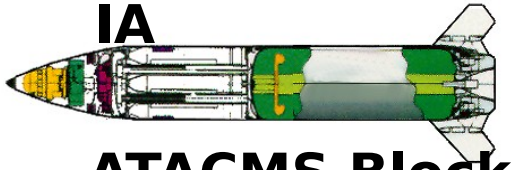
GMLRS



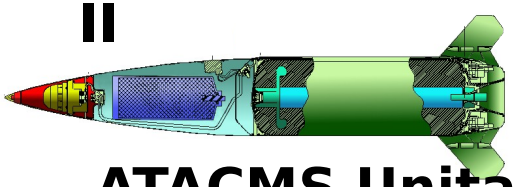
ATACMS Block I



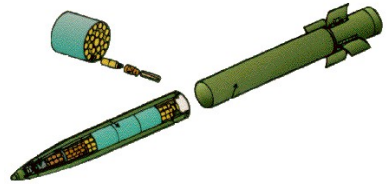
ATACMS Block IA



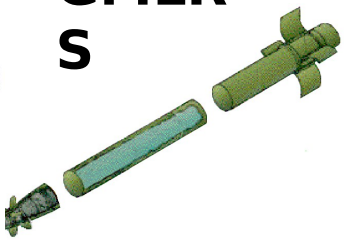
ATACMS Block II



ATACMS Unitary



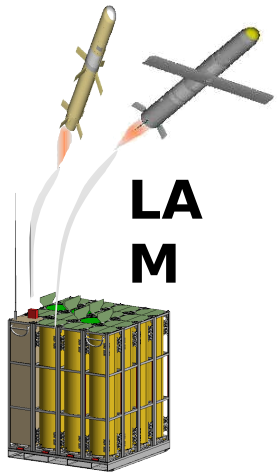
ER-MLRS



Unitary

PAM

BAT



LAM

C/LU

M270AI Launcher

Requirements

- Growth for Future Munitions
- Dramatically Reduce Timelines
- Increase Survivability
- Reduce Maintenance
- Reduce O&S Costs
- Enhanced

Description

- Fire Control Panel
- Weapons Interface Unit
- POS / NAV Unit (GPS)
- Power Switching Unit
- LCHR Interface Unit
- Open Architecture

Fires GPS-Aided Munitions

Current Timeline 0 9 3

Future Timeline 0 1 8

Schedule / Status/Issues

99 00 01 02 03 04 05

First Unit Equipped

Initial Operational Capability

Operational Test

- 4 of 10 Battalions currently Fielded
  - ✓ Two battalions in USFK
  - ✓2-4 FA Fielded One Year Early--- Dec 02
  - ✓*Combat Proven System*
- Eight of 18 battalions in Counter Attack Corps

High Mobility Artillery Rocket System HIMARS

Requirements

- C-130 Transportable
- Fire Entire MFOM
- Mission Cycle Time
- On board reload
- Interoperable with Current & Future Fire Support C2 Systems

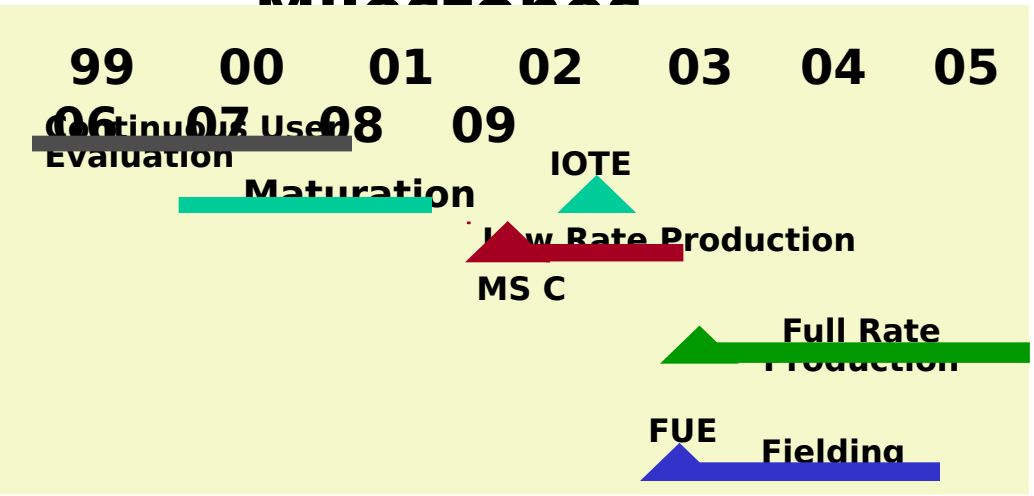
Combat Proven!

Fires GPS-Aided Munitions

Description

- FMTV 5 Ton Chassis
- Single Launch Pod
- Man-rated cab
- M270A1 IFCS
- Max Commonality w/M270A1
- GPS-Aided Pos Nav Unit

Schedule / Milestones



Status/Issues

- 8 Launchers Built (incl 2 USMC)
- Successful System Integration Test in Dec 03
- Successfully fired GMLRS rockets
- OT Sep – Dec 04
- First Unit Equipped 2QFY05
- Addressing Funding

PLAY
0:00:02

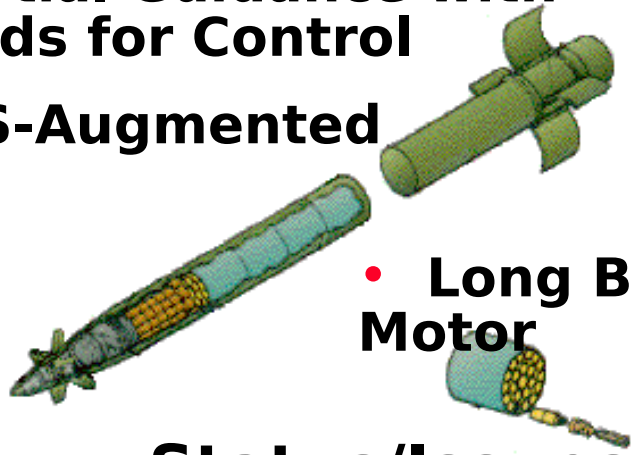
Guided MLRS Rocket

Requirements

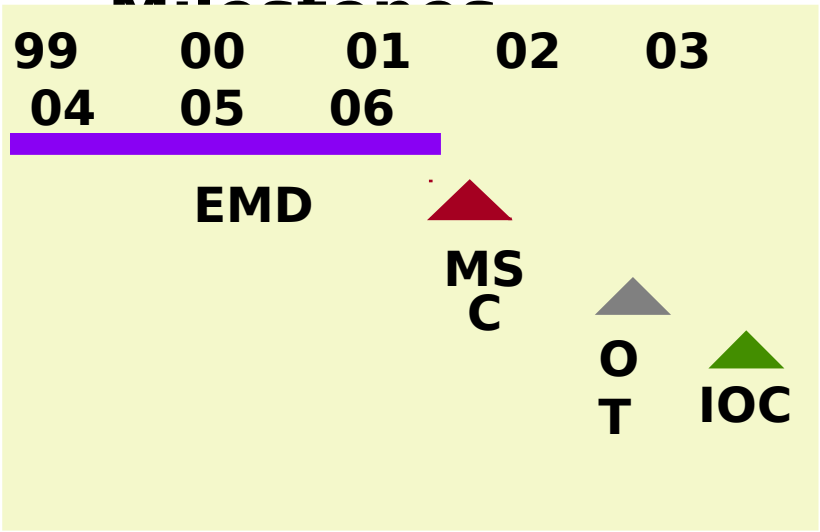
- Maximum Range: 60-70 Km
- Minimum Range: 10-15 Km
- Improved Effectiveness
- Changed dud rate to <2% @ 20-60km and <4% @ <20 and >60km
  - Objective is < 1%

Description

- Inertial Guidance with Canards for Control
- GPS-Augmented
- Long Burn Motor

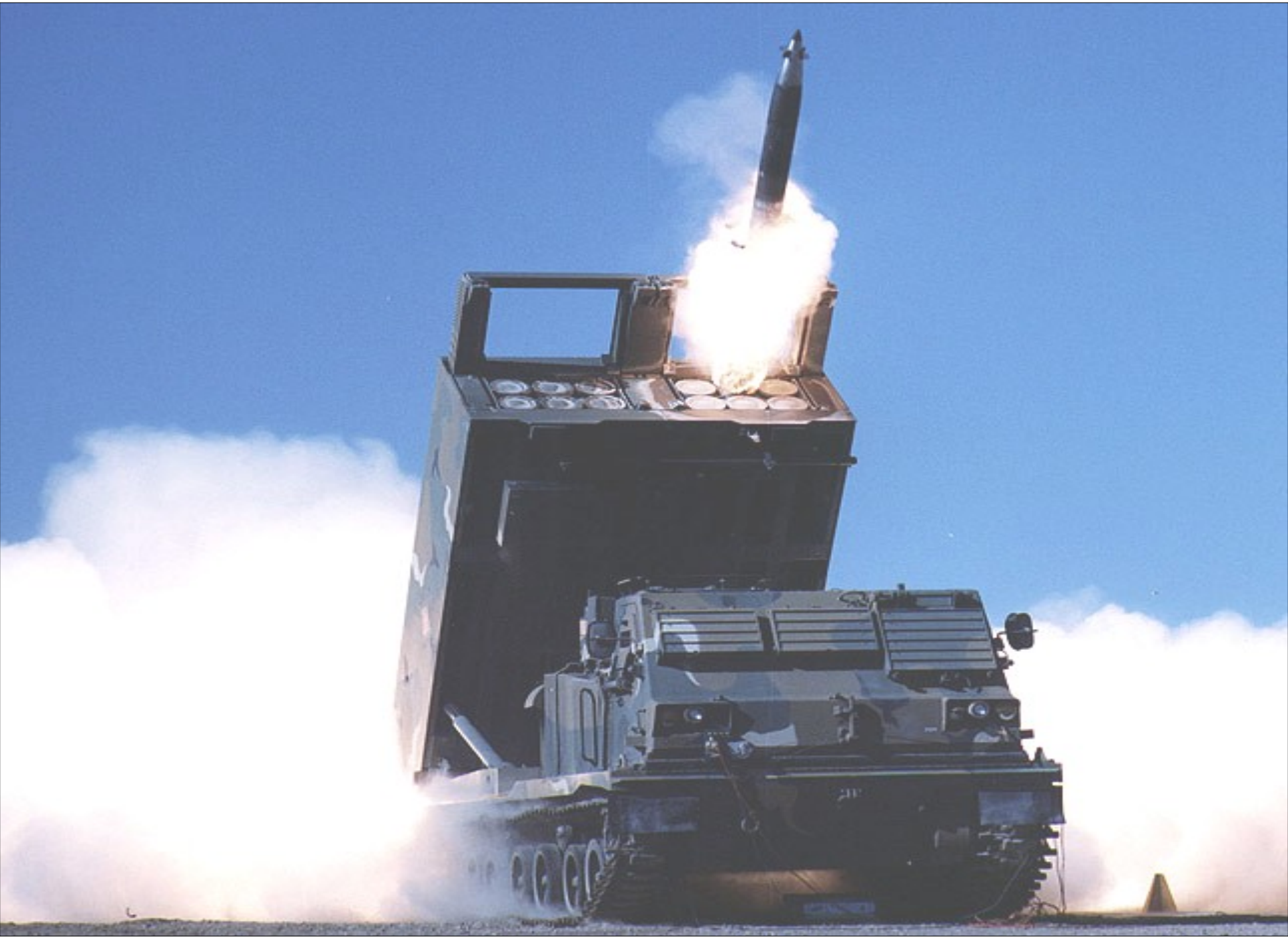


Schedule / Milestones



Status/Issues

- Demonstrated Ranges of 16.8 – 74.5 KM
- Self-Destruct Fuze Tests Ongoing – Results Promising
- OT Combined with HIMARS



TARGET SETS
GUIDED ROCKET FAMILY OF MUNITIONS

Target Categories
1. Personnel
2. Materiel
3. Structures

Payloads
1. DPICM
2. Unitary
3. Smart

Personnel

DPICM

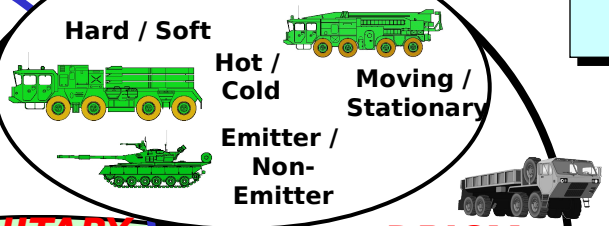
Smart

Hard / Soft

Hot / Cold

Moving / Stationary

Emitter / Non-Emitter



DPICM

Materiel

UNITARY

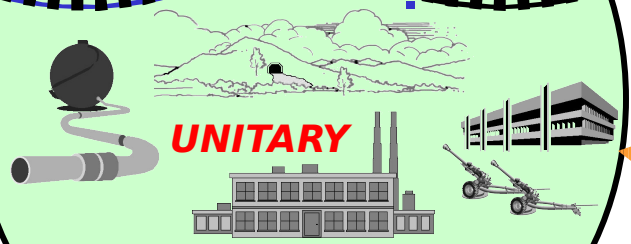
Restricted Terrain
Protected Positions
Collateral Damage Concerns

Target

Elements
- Personnel
- Vehicles
- Structures
- Weapons

+

Environment
- Open
- Woods / Urban
- In Buildings
- Fortifications
- Close To:
  - Friendlies
  - Non-Combatants
  - Protected Sites



UNITARY

Structures

Unitary Fills A Critical Warfighter Deficiency

Diagram intended to describe target set.
Size does not indicate target density.

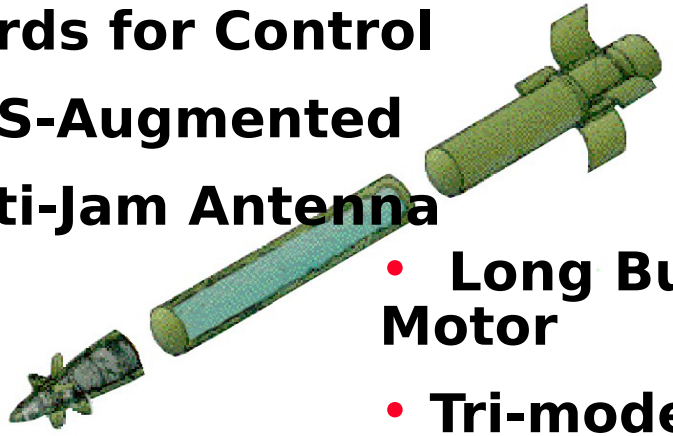
Guided Unitary Rocket

Requirements

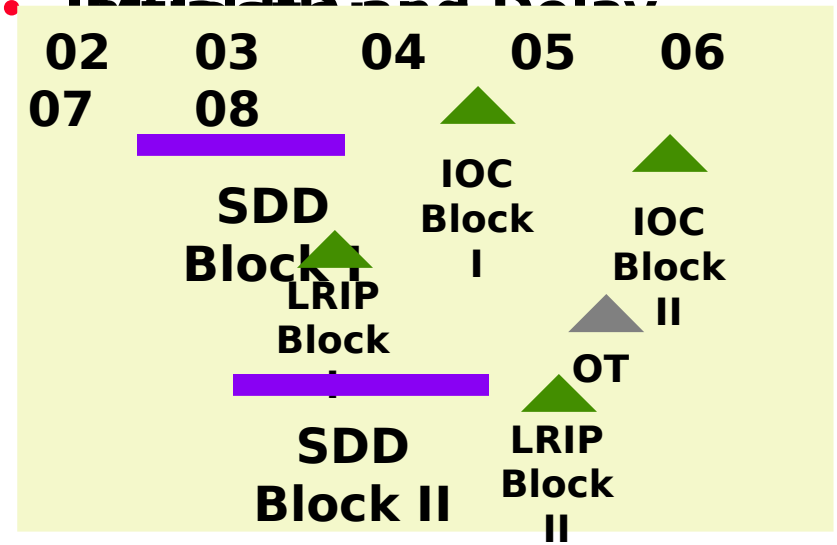
- Maximum Range: 60-70 Km
- Minimum Range: 10-15 Km
- Multi-Fuze Selection (Proximity, Point Detonating, Delay)
- IMU, GPS and Delay

Description

- Inertial Guidance with Canards for Control
- GPS-Augmented
- Anti-Jam Antenna
- Long Burn Motor
- Tri-mode Fuze



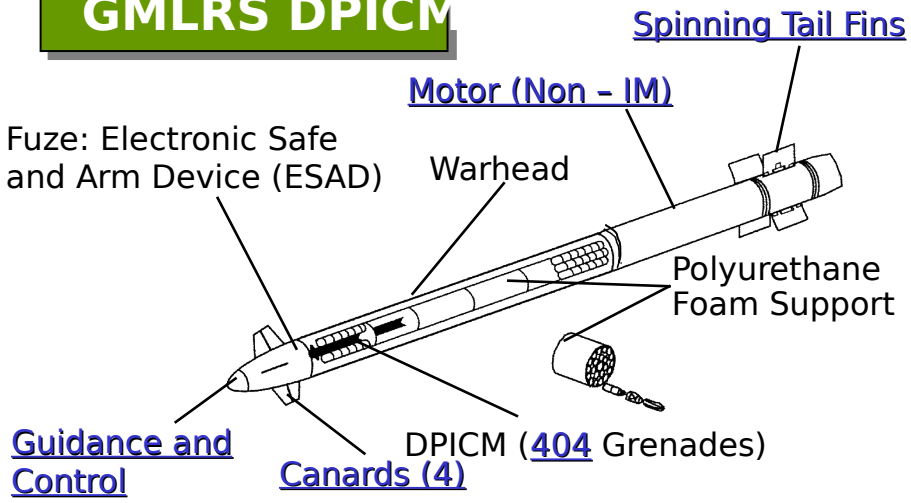
Schedule / Status/Issues



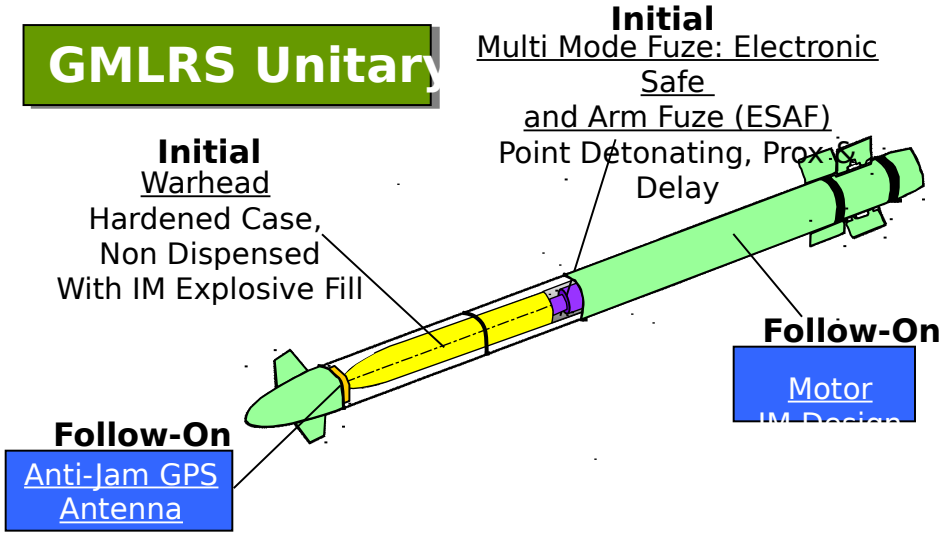
- Development Phase Contract Awarded 29 Sep 03
- Using a Block Approach for Development
- High Potential for International Development Program

GMLRS DPICM/GMLRS UNITARY COMPARISONS

GMLRS DPICM



GMLRS Unitary



Common Design Items Between GMLRS DPICM &

- ***Guidance & Control***
- ***Canards***
- ***Motor = Non - IM***
- ***Spinning Tail Fins***
- ***Pod***
- ***Common SW***
- ***Maintainability***
- ***Supportability***

Design Items for Initial

- ***Warhead With Insensitive Munition (IM) Design***
- ***Multi Mode Fuze:*** *PD, Prox & Delay Capabilities*

Design Items for Follow-On

- ***Motor = IM Design***
- ***Anti-Jam GPS, Antenna***
- ***CAIV Initiatives***
- ***Other Technology Opportunities (OTO) - Pit Stop***

Potential GMLRS Unitary Spiral Design Improvements for Future Increments and/or Bloc

GMLRS Unitary Rocket Demo 7
Aug 02

39 Km

ATACMS Blocks I & IA

TARGET SET

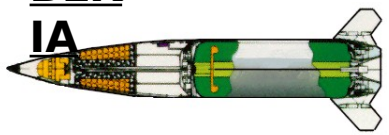
- AIR DEFENSE (SA-2,3,6,9,13, AND AAA)
- LOGISTICS
- HELICOPTER STAGING AREAS
- ASSEMBLY AREAS
- C2 SITES
- RADARS (SIDE NET, MARCONI, A.J.)

DESCRIPTION

BLK I

- INERTIAL GUIDANCE
- RANGE: 25-165KM
- 950 APAM
- ALL LAUNCHERS

BLK IA



- GPS-AIDED GUIDAN
- RANGE: 70-300KM
- 300 APAM

- M270 (IPDS)/M270A1/HIM

AIR TRANSPORTABILITY

- C5: 26 GMLAs
- C17: 18 GMLAs
- C141: 9 GMLAs
- C130: 4 GMLAs

HIGHLY EFFECTIVE IN OPERATION IRAQI FREEDOM (OIF)!

ATACMS Block II / BAT

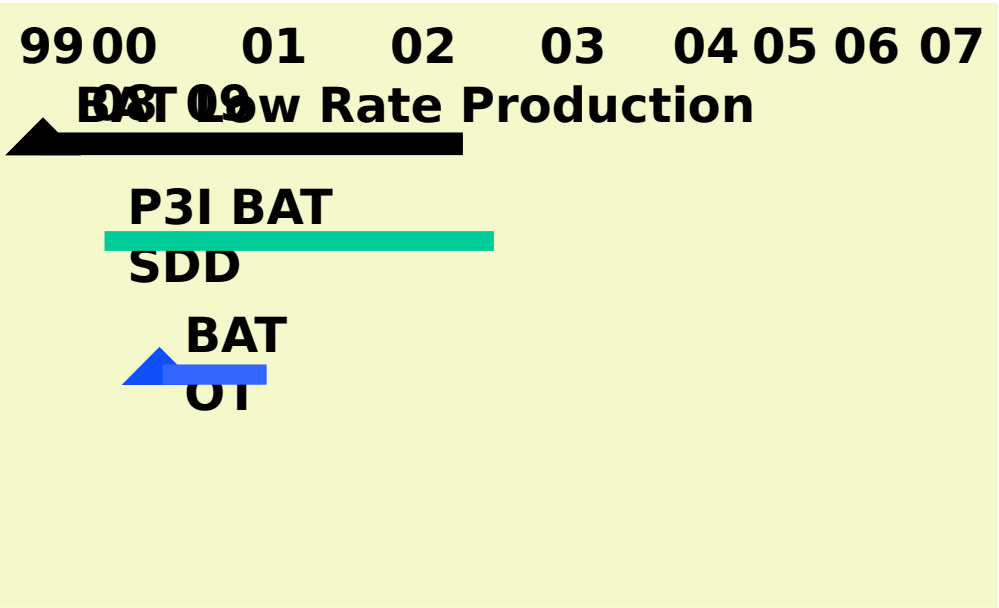
Requirements

- Targets - BAT: Moving Armored Combat Vehicle Formations. P3I BAT: Moving and Stationary Armor; MRLs/TELs
- Range: 35 - 145 KM
- 13 BATs/P3I BATs per Missile

Description

- 4 KM Search Radius
- Tandem Shaped Charge Warhead
- BAT: Acoustic and IR Sensors

Schedule /



Status/Issues

- Limited production/stockpile
- Successful test flight 12 Jun 03
- Deployed but not fired

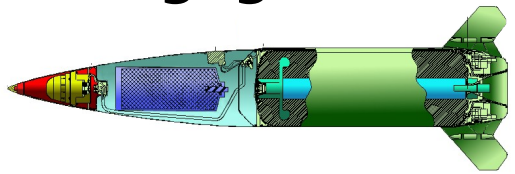
ATACMS Quick Reaction Unitary

Requirements

- Max Range: 270 Km
- Navy WDU/18B Harpoon Warhead
- Launched-M270 IPDS, M270A1, HIMARS
- Point Detonating (PD) Fuze

Description

- GPS-Augmented Inertial Guidance
- 300 Lb Class HE Warhead
- Minimizes collateral damage
- Precise Engagement of Point



Schedule / Milestones

01 02 03 04 05 06 07 08

Production

Status/Issues

- Congressional mandate
- Limited production
- Builds Upon Block IA
- ***Successfully Employed in OIF!***
- Incorporated into ATACMS Unitary ORD as Initial Capability

ATACMS Quick Reaction Unitary Flight Test

Range 139 km

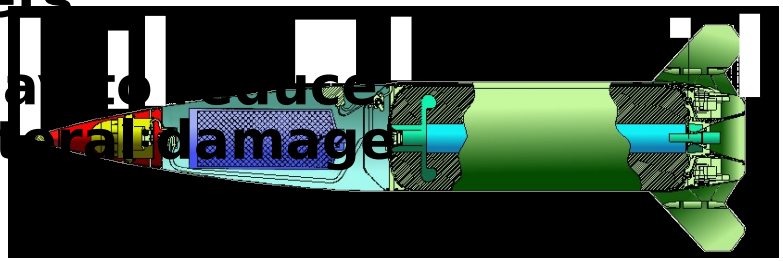
ATACMS Unitary

Requirements

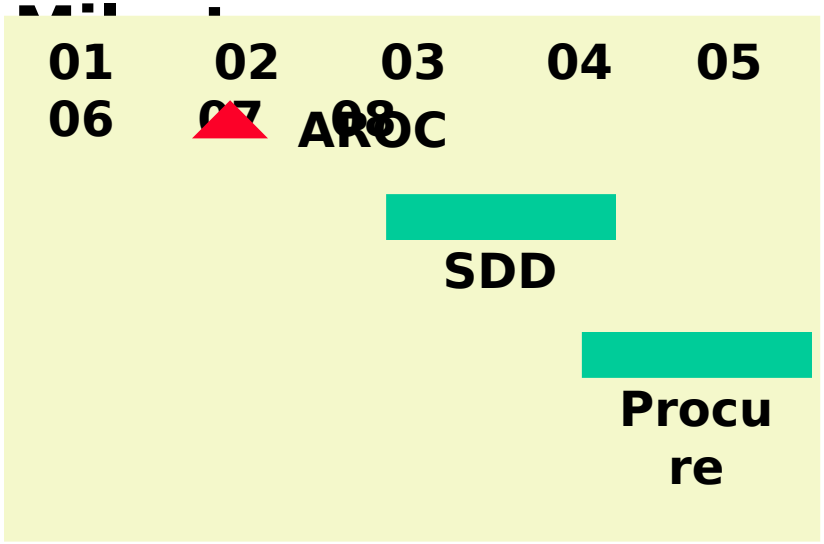
- Maximum Range: 70-300 Km
- Fuze - Point Detonating; Proximity & Delay (Objective)
- Employment in constrained environments

Description

- GPS-Aided Inertial Guidance
- HE Warhead
- Proximity for area targets
- Delay to reduce collateral damage



Notional Schedule / Milestones



Status/Issues

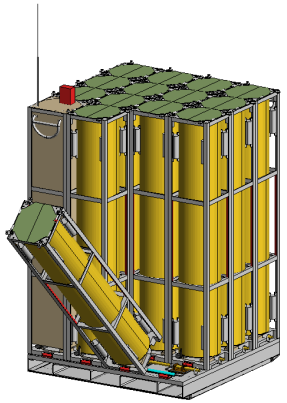
- ORD in Joint Staffing
- Program Unfunded

NON-LINE OF SIGHT LAUNCH SYSTEM (NLOS-LS)

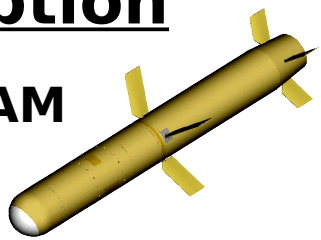
Requirements

- Vertical launch; not platform dependent
- Capable of unattended firing operations
- Supports autonomous and man in the loop engagements
- Threshold Range: PAM - .5 km to 40 km; LAM - .5 - 70 km with 30 minutes loiter time
- Rate of Fire: One missile every 5 seconds
- 15 missiles per Container / Launch Unit (C/LU)
- C/LU serves as shipping container and launcher
- C/LU is self-contained for power, communications, position/location and orientation

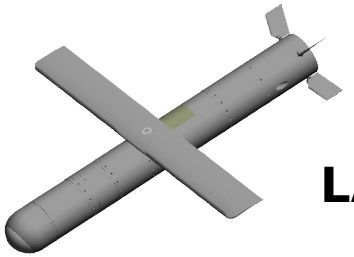
Description



C/LU

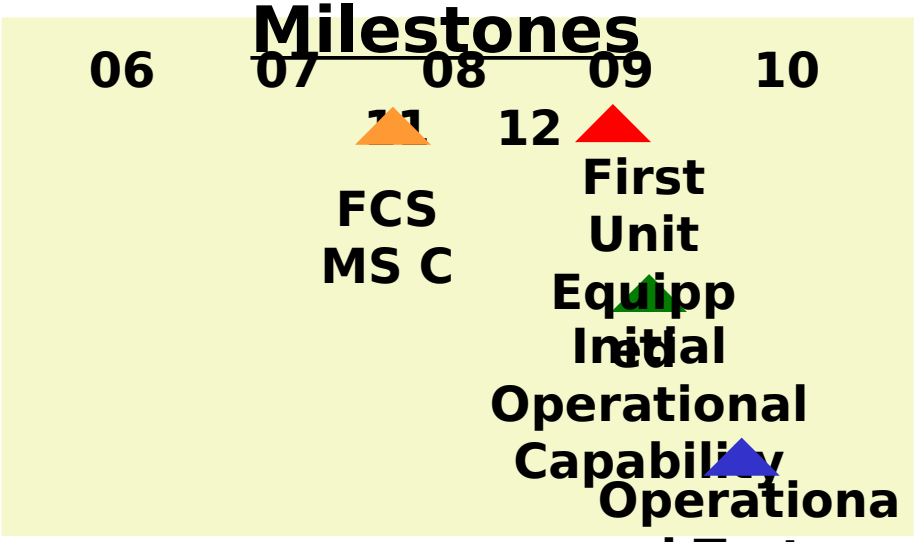


PAM



LAM

Schedule / Milestones



Status/Issues

- DARPA technology demonstration nearing completion
- JROC approved requirements 14 Apr 03
- Requirements under review (part of FCS FoS)
- Concept of Operations refinement

Non-Line of Sight (NLOS) Launch System (LS)

System now under development as a DARPA demonstration (NetFires)
Stand-alone or
vehicle mounted Container/Launch Unit (C/LU)

C/LU
Each C/LU holds 15 missiles (mix of LAM and PAM) plus CCS

PAM

Objective Force system

LAM

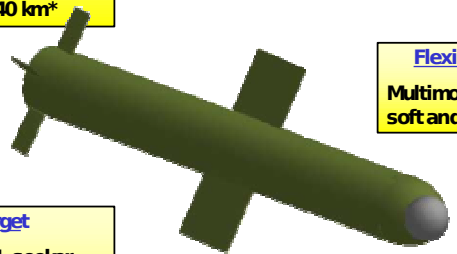
FCS
Manned or Robotic Follower

C/LU -- Container/Launch Unit with CCS -- Computer & Communications System

Precision Attack Missile

Missile Properties
Length: 55 in
Diameter: 7 in
Wt: 100 lb
Speed: 270 m/sec sprint
150 m/sec terminal
Range: 500m - 40 km*

* Denotes threshold capability



All-weather Jam-Resistant Digital Targeting
GPS/INS enables precision attack of stationary and moving targets

Flexible Lethality
Multimode warhead for soft and hard targets

Fire and Forget
Uncooled IR and SAL seeker locates and engages targets autonomously or cooperatively with external laser anointing

Not Platform Dependent
Vertical launch from C/LU on ground or manned/ unmanned vehicle

Loiter Attack Missile

Missile Properties
Length: 55 in
Diameter: 7 in
Wt: 100 lb
Speed: 200 m/sec cruise;
100 m/sec scan
Range: Up to 70 km plus 30 minutes loiter time*

* Denotes threshold capability

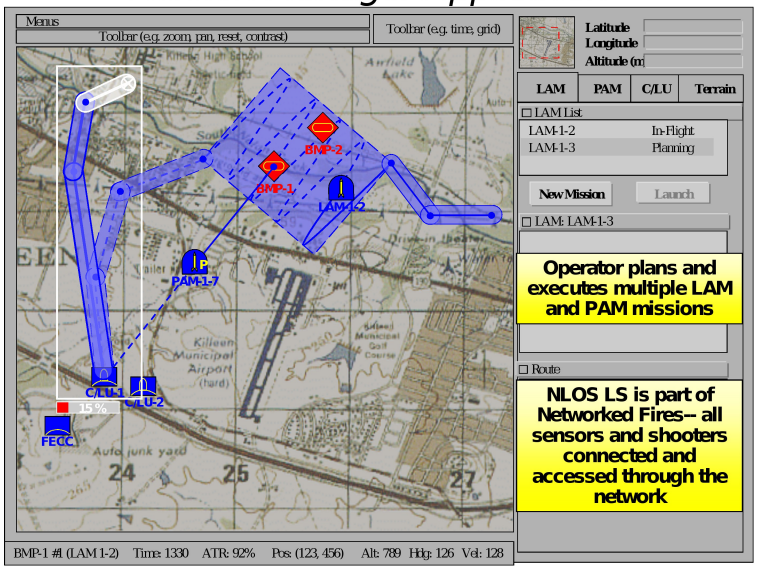
Common Jam Resistant Digital Targeting
GPS/INS for accurate search and target location. Data link provides targeting coordinates and BDA to operator and allows in-flight missile retasking

Flexible Lethality
Warhead optimized for light armor and soft targets

High Capability Seeker
LADAR seeker uses ATR to locate targets and provide BDA

Common Vertical Launch Compatibility
Booster rocket and mini-turbo jet sustain motor allow launch from same C/LU as PAM

Mission Manager Application



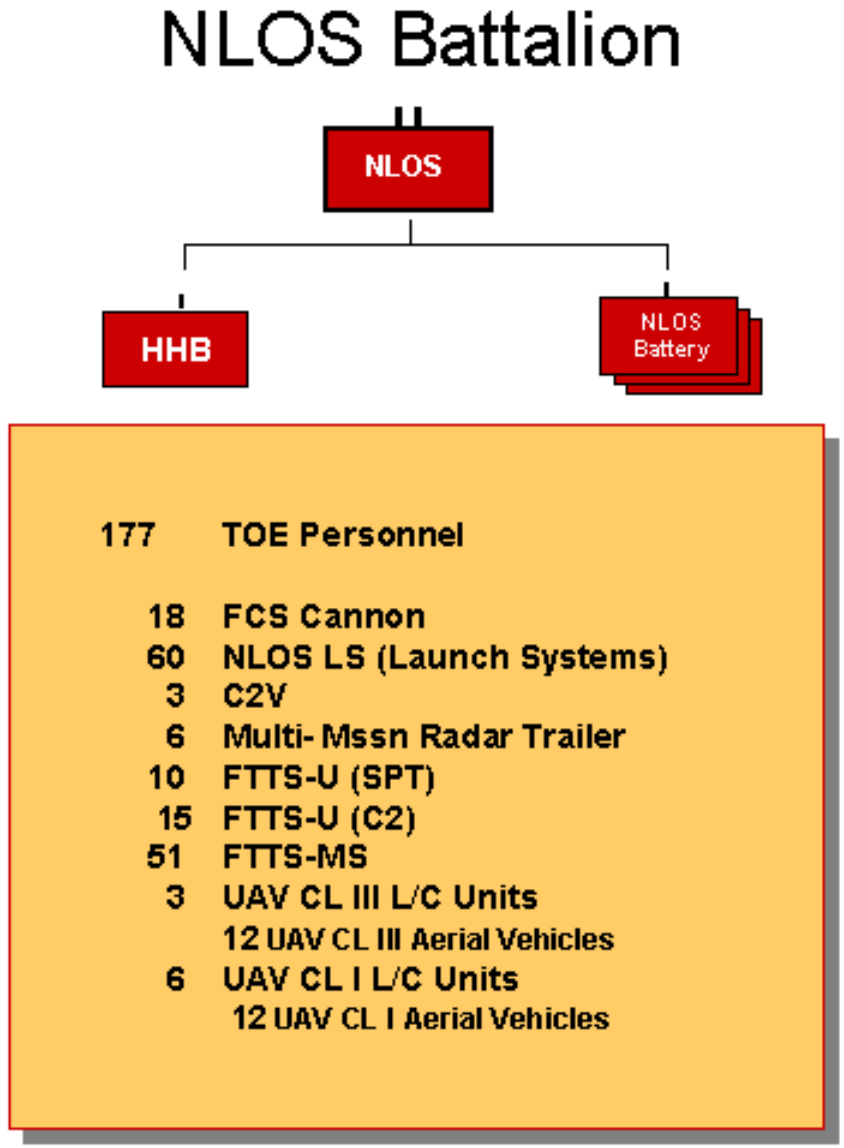
POC: MAJ Mark Laflamme, TSM RAMS (580) 442-8747 mark.laflamme@sill.army.mil Revised 17 DEC 03

NON-LINE OF SIGHT LAUNCH SYSTEM
PAM Test Flight – 10 Nov 03

Check Oil Level
After Running
Drop Check Valve

NLOS Battalion Organization

Increment 1 Objective



NLOS-LS Breakout:

Tailored to support mission.

NLOS PLT (HHB) 24

NLOS Btry (x3) 12 (36)

FY04 MAJOR EVENTS

- **Jan 04** **NLOS-LS SDD Phase Contract Aw**
- **Sep - Dec 04** **HIMARS/GMLRS IOTE**

SUMMARY

How The Best Will Get Better :

- **Stay Focused on Contributions to Army T**
  - **Modernize our Launcher Platforms**
    - -- State of the Art Electronics and Situational Aware
    - -- More Responsive
    - -- More Survivable
    - -- More Sustainable
    - -- More Deployable
  - **Improve Killing Efficiency of Rockets**
    - -- Increasing Range and Precision
    - -- Employment in Complex/Urban Environments
    - -- Adding Smart Munitions